

REMARKS

This Amendment is submitted in reply to the non-final Office Action mailed on March 17, 2011. No fees are believed to be due herewith this Amendment. The Director is authorized to charge any fees that may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 3712036-00742 on the account statement.

Claims 1-29 are pending in the application. Claims 14-29 were previously withdrawn. In the Office Action, Claims 1-4, 6, 8 and 11-13 are rejected under 35 U.S.C. §102. Claims 5, 7, 9 and 10 are rejected under 35 U.S.C. §103. In response, Claims 1-13 have been amended. The amendments do not add new matter and are supported in the specification at, for example, page 17, line 1-page 21, line 24; and the originally filed claims. In view of the amendments and/or for at least the reasons set forth below, Applicants respectfully request that the rejections be reconsidered and withdrawn.

In the Office Action, Claims 1-4, 6, 8 and 11-13 are rejected under 35 U.S.C. §102(b) as being unpatentable over U.S. Patent No. 5,345,781 to Fels et al. ("*Fels*"). Applicants respectfully submit that *Fels* is deficient with respect to the present claims.

Currently amended independent Claim 1 recites, in part, a low temperature extrusion process including locally adjusting a rotational screw speed of an extruder screw; locally adjusting a mass flow rate of the frozen aerated masses, the mass flow rate adjusted by a positive replacement pump installed at an extruder inlet; and locally adjusting a cooling temperature at an inner wall of an extruder housing, the cooling temperature adjusted by an evaporation pressure of refrigerant, the process providing a mechanical treatment of a partially frozen, aerated mass over a length of an extruder screw channel zone with respect to its local viscosity, performed such that, in each of a subsequent zone there is a dispersing of air bubbles/air cells and at a same time a temperature decrease and related increase of the frozen water fraction is achieved. The amendments do not add new matter and are supported in the specification at, for example, page 17, line 1-page 21, line 24; and the originally filed claims. The present disclosure is based on the optimization of the energy input provided during a low temperature freezing extrusion process applied to a partially frozen mass. The present disclosure has the double aim of (i) generating a

homogeneous finer microstructure in the frozen mass, and (ii) optimizing the conditions for the transfer of dissipated and phase transition heat generated during the process.

More particularly, the present claims are based on the fact that the energy input provided during the extrusion process is modified along the extruder length, by zones, thus generating an input which is locally (in each zone) adapted to the local heat transfer. Practically, as the partially frozen mass goes along the extruder, its viscosity increases (with the increase of frozen water fraction) and as a consequence the dissipated heat provided by the friction and the crystallization increases as well. A gradient of mechanical energy is provided by adjusting the shear treatment to the local viscosity of the mass, which allows finer dispersing of the microstructure components (ice crystals, air bubbles/air cells, fat globule agglomerates) and optimized conditions for the heat transfer. Applicants respectfully submit that *Fels* fails to disclose or suggest each and every element of the present claims.

For example, *Fels* fails to disclose or suggest a low temperature extrusion process including locally adjusting a rotational screw speed of an extruder screw; locally adjusting a mass flow rate of the frozen aerated masses, the mass flow rate adjusted by a positive replacement pump installed at an extruder inlet; and locally adjusting a cooling temperature at an inner wall of an extruder housing, the cooling temperature adjusted by an evaporation pressure of refrigerant, the process providing a mechanical treatment of a partially frozen, aerated mass over a length of an extruder screw channel zone with respect to its local viscosity, performed such that, in each of a subsequent zone there is a dispersing of air bubbles/air cells and at a same time a temperature decrease and related increase of the frozen water fraction is achieved as recited, in part, by currently amended independent Claim 1. Instead, *Fels* is entirely directed to a device designed such as to cool down edible foams to storage temperature on a continuous basis, with good mixing and uniform and homogeneous removal of heat. See, *Fels*, column 6, lines 18-21. The device of *Fels* includes at least a double screw system with two screws positioned parallel to each other. The device for deep freezing, according to *Fels*, implements an essentially homogeneous mechanical energy input, based on the use of a special double screw system. See, *Fels*, column 6, lines 54-56.

Fels therefore differs from the present claims in that the mechanical energy input is homogeneous during the extrusion process, while the mechanical treatment is modified and

raised or zone-wise adapted to the local viscosity of the partially frozen mass during the extrusion freezing process according to Claim 1. In other words, *Fels* fails to disclose or suggest any process comprising the application of a gradient of mechanical energy along the extruder, as a function of the viscosity increase of the partially frozen mass, and *Fels* fails to disclose locally adjusting parameters over the length of the extruder screw channel.

Further, anticipation is a factual determination that “requires the presence in a single prior art disclosure of each and every element of a claimed invention.” *Lewmar Marine, Inc. v. Barient, Inc.*, 827 F.2d 744, 747 (Fed. Cir. 1987) (emphasis added). Federal Circuit decisions have repeatedly emphasized the notion that anticipation cannot be found where less than all elements of a claimed invention are set forth in a reference. See, e.g., *Transclean Corp. v. Bridgewood Services, Inc.*, 290 F.3d 1364, 1370 (Fed. Cir. 2002). As such, a reference must clearly disclose each and every limitation of the claimed invention before anticipation may be found. Because *Fels* fails to disclose or suggest each and every element of the present claims, *Fels* fails to anticipate the present claims.

Accordingly, Applicant respectfully requests that the anticipation rejections with respect to Claims 1-4, 6, 8 and 11-13 be reconsidered and the rejections be withdrawn.

In the Office Action, Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Fels* in view of U.S. Patent No. 5,024,066 to Goavec (“*Goavec*”). Claims 7, 9 and 10 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Fels* in view of U.S. Patent No. 5,221,504 to Capelle (“*Capelle*”). Applicants respectfully submit that the patentability of Claim 1 as previously discussed renders moot the obviousness rejection of Claims 5, 7, 9 and 10 that depend from Claim 1. In this regard, the cited art fails to teach or suggest the elements of Claims 5, 7, 9 and 10 in combination with the novel elements of Claim 1.

Further, *Govaec* and *Capelle* also fail to disclose or suggest a low temperature extrusion process including locally adjusting a rotational screw speed of an extruder screw; locally adjusting a mass flow rate of the frozen aerated masses, the mass flow rate adjusted by a positive replacement pump installed at an extruder inlet; and locally adjusting a cooling temperature at an inner wall of an extruder housing, the cooling temperature adjusted by an evaporation pressure of refrigerant, the process providing a mechanical treatment of a partially frozen, aerated mass over a length of an extruder screw channel zone with respect to its local viscosity, performed such

that, in each of a subsequent zone there is a dispersing of air bubbles/air cells and at a same time a temperature decrease and related increase of the frozen water fraction is achieved as recited, in part, by independent Claim 1.

Instead, *Govaec* describes an installation for making ice creams comprising a freezing system to cool and homogenize the product. The freezing system is characterized by stirring means comprising Archimedes' screw furnished on its periphery with scraper knives. See, *Govaec*, Abstract. Although emphasizing the importance of the quality of shearing, *Govaec* is silent about modifying the energy input along various zones of an extruder as a function of the increasing viscosity of a partially frozen mass. Because *Fels* and *Govaec* fail to disclose or suggest at least local adjustments of parameters along the length of the extruder, *Fels* and *Govaec*, alone or in combination, are deficient with respect to the present claims.

Capelle is entirely directed to an apparatus having a pin-lined barrel section and a Transfermix section for increasing the material throughput and mixing quality of an extruder. See, *Capelle*, Abstract. Because *Fels* and *Capelle* fail to disclose or suggest at least local adjustments of parameters along the length of the extruder, *Fels* and *Capelle*, alone or in combination, are deficient with respect to the present claims.

For at least the reasons discussed above, Applicants respectfully submit that Claims 5, 7, 9 and 10 are novel, nonobvious and distinguishable from the cited reference.

Accordingly, Applicant respectfully requests that the obviousness rejections with respect to Claims 5, 7, 9 and 10 be reconsidered and the rejections be withdrawn.

For the foregoing reasons, Applicants respectfully request reconsideration of the above-identified patent application and earnestly request an early allowance of the same. In the event there remains any impediment to allowance of the claims which could be clarified in a telephonic interview, the Examiner is respectfully requested to initiate such an interview with the undersigned.

Respectfully submitted,

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